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MEMORANDUM

TO: MR. PAUL BAKER, DIVISION OF OIL, GAS AND MINING

FROM: MR. DOUGLAS BACON, DERR PROJECT MANAGER, KUCC SOUTH ZONE

SUBJECT: E-MAIL REQUEST FOR INFORMATION

DATE: 1/6/2003

CC: MR. TOM MUNSON, DIVISION OF OIL, GAS AND MINING

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Mr. Baker, per your request I have enclosed two documents drafted by Kennecott Land Company (KLC). The first document contains some general site information about the South Jordan Evaporation Ponds and the proposed sludge removal activity. The document also contains KLC's responses to DERR's first comment letter concerning the previously submitted operation and maintenance plan and some supporting information. The second document is the revised operation and maintenance plan that has been approved by the United States Environmental Protection Agency Region VIII. If while you are reading this information you determine that you need to have a copy of the other supporting documentation (i.e., sampling data from trenches, infiltration/leachability data for the sludge sediment, and the work plans for the pond sludge removal from the Evaporation Ponds and the soil removal from the Bastian Sink), please let me know.

-Douglas Bacon

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Kennecott Land

OPERATION AND MAINTENANCE OF THE RECLAIMED KENNECOTT SOUTH JORDAN EVAPORATION PONDS

Amended Plan

INTRODUCTION

The former South Jordan Evaporation Ponds (Ponds) site was used historically to store and evaporate surface water from the Bingham Canyon watershed. Remediation of the Ponds was addressed in an Administrative Order on Consent (AOC) between the United States Environmental Protection Agency (EPA) and Kennecott Utah Copper Corporation (Kennecott) on September 13, 1994 (CERCLA VIII-94-18). This amended Operations and Maintenance (O&M) plan reflects the removal of sulfate-bearing sludge from the Consolidation Area described herein by Kennecott Development Company in 2002-2003. The O&M plan may be amended again, with concurrence from EPA, whenever future site changes or events occur that may affect the performance of the approved remedy.

LOCATION

The Ponds site is located in South Jordan City about seven miles east of the Bingham Canyon Mine, one mile south of Bingham Creek, and five miles west of the Jordan River (Township 3 S, Range 2 W, in parts of sections 13 and 24, and in Township 3 S, Range 1 W, in parts of sections 18 and 19).

REMEDIAL ACTION

The Ponds were initially remediated in 1993-96. The site included approximately 1200 acres and contained 25 artificial ponds. Pond sediments in the northernmost pond and waste rock in dikes between the ponds were removed and hauled to the Kennecott Bluewater Repository. Remaining non-hazardous pond sediments were excavated, transported on-site, and blended with berm and granular borrow materials to optimize compaction and provide cover for existing pond sediments in the Consolidation Area. Acceptable topsoil was salvaged during construction activities and placed on the soil cover in all disturbed areas. The consolidated pond sediments were placed on a footprint of about 212 acres (Consolidation Area) and covered with 36 inches of clean soil and 6-12 inches of topsoil. Adjacent areas and cleaned ponds outside of the Consolidation Area were covered with 12 inches of soil. The soil cover

was scarified to depths of 6-16 inches and disced to allow seeding.

Initial seeding of the Consolidation Area with natural grasses was completed in spring 1995. The condition of vegetation on all the seeded areas was monitored, and remedial revegetation was performed in December 1995 and spring 1996.

In 2002 and 2003, the sulfate-bearing pond sediments in the Consolidation Area was removed and transported to the Copper Notch area of the Bingham Canyon Mine waste rock dumps under an EPA- and Utah Department of Environmental Quality (UDEQ)-approved work plan. Mixed soils that capped the sludge were used in part for mass grading and fill in the Sunrise South Jordan master planned community (MPC) (see below). Topsoil and cap soil were stockpiled for use in the MPC, and the remaining mixed soil was returned to the Consolidation Area.

MASTER PLANNED COMMUNITY

The Sunrise South Jordan MPC is part of South Jordan City. The location and basic planning elements are shown in Figure 1. The community will ultimately consist of more than 13,500 residential units; retail, commercial and light industrial development; and substantial office space. Phase 1 of the development, which commenced in 2003, is shown in Figure 2. Approximately one million cubic yards of mixed soils from the Consolidation Area were used as part of the mass grading of the Phase 1 site. These soils were compacted to between 90 and 95 percent and underlie roadways, driveways, housing and commercial pads, and open space, much of which is xeriscaped. All development is under restrictive covenants (Covenants, Conditions & Restrictions) related to the MPC, as well as City zoning and code restrictions. These CC&Rs and codes determine land use and therefore restrict areas where artificial irrigation occurs, thus reducing the potential seepage of residual sulfate in the mixed soils to groundwater (see attached HELP seepage model).

FUTURE SITE USES

The original removal and reclamation of the Ponds satisfied the remedial objectives of the AOC. EPA determined that no further action was required. EPA noted that the Consolidation Area and surrounding cleaned area could be used for an MPC. No institutional controls were needed because the soils remaining on site contain low levels of lead and arsenic. However, irrigation was to be controlled on the

consolidation area so that sulfate in the covered sludge was not leached into groundwater. Because the sludge has now been removed from the Consolidation Area, no further response is required at the site except to demonstrate that artificial irrigation of the mixed soils does not increase the seepage of sulfate to groundwater over that which would have occurred from natural (meteoric) seepage in the original consolidation area, as demonstrated in the attached HELP model.

MAINTENANCE PROGRAM

The consolidation area and MPC will be inspected on an annual basis for the following criteria, and if required, the appropriate correction action will be implemented:

- **Ensure that the CC&Rs and land uses are properly implemented.** If areas of the MPC are found to be out of compliance, bring them into compliance with the CC&Rs.
- **Restrict artificial irrigation of mixed soils.** Ensure that the percentage of areas with mixed soils that are irrigated does not exceed the amount indicated in the HELP model.

General Comments by Kennecott Land

Background

The Kennecott Utah Copper (KUC) South Jordan Evaporation Ponds were remediated under an Administrative Order on Consent (AOC), signed in 1994, by KUC with EPA and State (UDEQ) oversight. Pond sediments and mixed soils left on site were considered non-hazardous to human health and the environment and were placed in a capped repository to eliminate nuisance and wind erosion. A new company, Kennecott Land, is developing the Evaporation Ponds site as part of the Sunrise South Jordan master planned community. In order to build on the repository site, Kennecott Land proposes to remove the pond sediment in the repository and place it in a new repository (Copper Notch) at the foot of the Bingham Canyon Mine waste rock dumps. The remaining material in the repository will be used for fill in the Sunrise South Jordan master planned community.

Data Summary

- The footprint of the capped Evaporation Pond repository site covers approximately 212 acres.
- Respective soil units and volumes in the repository (based upon March 2002 test pit results):
  1. Top soil, 246,303 cubic yards
  2. Cap soil, 863,657 cubic yards
  3. Mixed soil and pond sediment, 2,138,284 cubic yards (hereafter termed mixed soil); the mixed soil consists of approximately 18% pond sediment
  4. In-place pond sediment, 1,681,954 cubic yards.
- The in-place pond sediment is not suitable for the support of shallow foundations due to its variable engineering characteristics and distribution of compressible materials.
- According to the geotechnical studies on the site, the mixed soil can be used for fill, yard construction and road grade materials.
- Kennecott Land proposes to redistribute the mixed soil in the Sunrise development area within the pond sediment footprint and onto 168 acres of new development area. For construction purposes, the mixed soil will be compacted to 90-95%. After mass grading, the total acreage containing mixed soil will be 336 acres. Of these 336 acres, 101 acres will be irrigated open space, 84 acres will irrigated backyards and the remaining 151 acres will be capped with roads and covered with houses. The footprint of the current repository site, which is part of the 336 acres, will also be modified so that 160 acres will be available to receive meteoric or irrigation waters; the remaining 50 acres will be covered with an impermeable liner.
- Criteria for assessing the significance of metals in soils have been developed by EPA and KUC for removal actions in Bingham Creek and Herriman. Preliminary remediation goals (PRGs) were developed for lead

using the IEUBK lead model and were determined to be 1000 mg/kg for Bingham Creek and 1200-1700 mg/kg for Herriman. The PRGs for lead were developed with the use of site-specific exposure and bioavailabilty data (for Bingham Creek and Herriman) that resulted in values higher than the default value of 500 mg/kg. PRGs for arsenic were set 100 mg/kg for both sites (Bingham Creek and Herriman) with the view that if soil lead were remediated to less than the selected lead PRG, the arsenic level would be less than 100 mg/kg [1,2]. Concentrations less than the above PRG values were considered acceptable for residential use.

- EPA developed an additional source of information for judging the safety of metal concentrations in Kennecott soils for a broad range of uses of KUC property including industrial, commercial and recreational uses [3].
- The Record of Decision for the Kennecott South Zone Site indicates that the maximum and mean concentrations of lead and arsenic in sludges present prior to remediation were 10,400 and 207 mg/kg (lead) and 1330 and 74 mg/kg (arsenic), respectively. Maximum and mean concentrations in the post-removal samples (in soils below the where the sludge had been deposited) were significantly lower and were reported to be 237 and 93 mg/kg (lead) and 41 and 19 mg/kg (arsenic).
- Recent soil sampling was conducted by Kennecott Land. Sixty-two samples were collected of pond sediment and underlying native soil from the backhoe bucket. Forty-eight of the samples were analyzed at Kennecott Environmental Laboratory. The sludge samples were analyzed for moisture content in order to determine how much shrinkage could occur if dried. In addition, all samples were analyzed for total lead and arsenic, paste pH and conductivity of the paste pH solution. Ten of the forty-eight samples were also analyzed for total and leachable (TCLP) concentrations of silver, barium, cadmium, chromium, selenium and sulfate. These data are summarized in Table1 [4]. These samples are appropriate for assessing pond sediment to be deposited at the Copper Notch repository, but do not include samples of the mixed soil layer residing in the repository above the sludges.

Preliminary Risk Analysis

- Mixed soils were not specifically sampled by Kennecott Land. To evaluate whether or not metals in the mixed soils layer might be of concern, data collected on 46 samples of pond sediments and stained soils that were mixed with native soil and placed on top of in-situ pond sediment in the repository were used [5,6]. The results indicate that arsenic ranged up to 107 mg/kg with a mean value of 22 mg/Kg. Lead ranged up to 570 mg/kg with a mean value of 80 mg/kg. These values would not indicate a health concern with the exception of the one sample that contained arsenic at 107 mg/kg. However, the pond sediment only constitutes 18% of the final mixed soil in the repository and hence, the final mixed value would be much lower [5]. Kennecott Land concluded that the low levels of metals in the mixed soils should not present a human health hazard for residential

use. A review of the available data for the other RCRA metals [6] suggests there also does not appear to be a human health issue.

- Sulfate concentrations in the mixed soils average 5% (50,000 mg/kg)[7]. There is no standard or PRG that identifies a concern for ingestion of soil with sulfate. However, the CERCLA ARAR for the South End KUC ROD identified 1500 mg/L sulfate as a threshold in drinking water, which, if exceeded, would be likely to cause diarrhea. Using this as a starting point and assuming that a 1- 5 year-old child might drink 1.0 liter/day, this would be equivalent to a dose of 1500 mg of sulfate/day. A typical value used for child ingestion of soil in assessing lead soil ingestion is ~100 mg soil/day. Assuming an average sulfate concentration of 50,000 mg/kg in the mixed soil, this equates to an ingestion of 5 mg of sulfate per day. A comparison of the two values indicates that even if a child accidentally ate 10 grams of dirt, the dose would be 500 mg of sulfate. Alternatively, if there were local hot spots and the soil contained 20% sulfate, the daily dose would be 20 mg for a child ingesting 100 mg soil/day. Kennecott Land concluded that sulfate in the mixed soils should not present a human health concern. However, additional post-removal risk analysis will be conducted to verify this hypothesis (see below).
- The effects of the removal action on groundwater were modeled using the HELP model [7]. The results of this modeling indicated that the removal would reduce the sulfate load to groundwater by a factor of eight from the current repository situation.
- If the infiltration from the Copper Notch repository is included in the total sulfate load to groundwater after removal, the total sulfate load is reduced by a factor of six [7,8]. However, this infiltration is largely captured by the Eastside Collection system rather than reporting to bedrock.

Additional Studies

- Soil salinity in the mixed soils may affect plant growth. Studies are underway to evaluate this possibility. If soil salinity is an issue, Kennecott Land will amend the mixed soils to increase plant viability (and thereby further dilute salinity and sulfate concentrations).
- As the soil chemistry of the mixed soils in the repository is variable, additional samples will be collected from the mixed soils as a means of developing further assurance that there will be no health hazard associated with these soils. Several options exist for collecting these soil samples: (1) collect in advance of any movement of the mixed soils; (2) collect from the mixed soils as they are being uncovered and moved; or (3) collect after the mixed soils are moved, mixed with additional soil and placed in the developed areas (residential yards and open space). Because the spreading and soil amendment process will serve to further dilute the concentration of metals and sulfate in the mixed soils, this later approach will likely yield a more accurate assessment of risk on a site-by-site basis. The latter approach has the disadvantage that if concentrations of metals are measured above thresholds of concern, soil removal or

additional mixing may be required. However, the risk of this occurring appears small considering the metal levels in the mixed soils are low in the samples collected to date. Kennecott Land favors option 3, but may also use options 1 and 2 if appropriate.

Summary

Based on the above factual data and a preliminary risk analysis, Kennecott Land believes that the pond sediment can be effectively removed, the mixed soil can provide a safe and useful fill for the Sunrise Project, the load to groundwater from sulfate will be substantially reduced, and that impacts to health are negligible. Kennecott Land will substantiate this conclusion with additional health studies after the mixed soil has been placed in the Sunrise Project and will amend the soils if soil salinity or human health issues are identified in the post-fill studies.

References

(1) USEPA. 1993. Preliminary Endangerment Assessment Bingham Creek Channel - Phase 2 ("Preliminary Endangerment Assessment II"); prepared February 1993.

(2) USEPA. 1996. Preliminary Endangerment Assessment Herriman Soil Removal.

(3) CDM Federal Programs Corporation. 1999. Preliminary Remediation Goals For Addressing Risks To Human Health From Exposure To Chemicals In Kennecott Soils.

(4) Kennecott Development Corporation. 2002. Table 1. Sampling and Analytical Data for Samples Collected from Trenches Excavated at the Evaporation Pond Site, March 2002. October.

(5) North American Mine Services. 2002. Arsenic and Lead in Pond Sediments Used to Make Mixed Soils. October.

(6) Kennecott Land. 2002. Table 2. Characterization of Pond Sediment Prior to Mixing with Native Soil. October.

(7) Kennecott Development Company. 2002. South Jordan Evaporation Ponds Consolidation Area: Infiltration and Leachability Of Sulfate. October.

(8) Kennecott Development Company. 2002. Copper Notch Repository: Infiltration and Leachability of Sulfate. October.

(9) Kennecott Land. 2002. Operation and Maintenance of the Reclaimed Kennecott South Jordan Evaporation Ponds. October.

(10) Kennecott Development Company. 2002. Evaporation Pond Analytical Results of March 2002 Trenching and Sampling. October

(11) Kennecott Development Company. Table 3. Total and TCLP Leachable Analytical Data for Samples Collected from Evaporation Pond Trenches, March 2002.

Kennecott Land Response to
DERR Comments on the Information Packet for the South Jordan Evaporation Ponds Cleanup

General Comments:

(1) Throughout the text of the submittals the phrases pond sediment and pond sludge are used interchangeably. DERR suggests that Kennecott Development Company (KDC) determine which phrase is appropriate and stick to one throughout the text of each submittal.

KDC (Kennecott Land) hereafter will use the term "pond sediment" and not pond sludge.

Comments on the Operation and Maintenance of the Reclaimed Kennecott South Jordan Evaporation Ponds – Amended Plan:

(1) Page 2, Remedial Action, 2nd paragraph, 2nd and 3rd sentences. It states that mixed soils that capped the sludge were used in part for mass grading and fill in the Sunrise South Jordan master planned community. It further states that of the mixed soils, topsoil and cap soil were stockpiled for use in the MPC, while the remaining mixed soils were returned to the Consolidation Area. Please explain the reason as to why the mixed soil material remained on-site. Please provide the final concentrations of the contaminants of concern in the mixed soils. Please explain why the other mixed soil was returned to the Consolidation Area. Please state where the mixed soils were placed in the MPC and whether it is in areas requiring supplemental irrigation.

Kennecott Land plans to strip the cap soil and mixed soil off the pond sediment in order to remove the pond sediment. The cap soil will be stockpiled near the Consolidation Area. Engineering and soil chemistry data indicate that the mixed soils can be used for fill in the mass grading required in the Sunrise Project. Approximately half (~1 million cubic yards) of mixed soil will be stripped off the Consolidation Area with scrapers and moved approximately one-quarter mile south and used as part of the mass grading for the Sunrise Project. One-half of the mixed soil residing on top of the pond sediment will need to be removed with a trackhoe because scrapers will break through the mixed soil into the pond sediment. As the trackhoe removes the remainder of mixed soil to expose the pond sediment, the mixed soil will be cast adjacent to the pond sediment onto an area where the pond sediment has been removed.

The mixed soil will remain on site because it is not hazardous, is geotechnically suitable for fill and can be used as part of the mass grading for Sunrise. The estimated arsenic concentrations in the mixed soil will average less than 30 mg/kg and the lead will be less than 100 mg/kg. Approximately 55 percent of the final mixed soil area, minus the lined pond

area, will probably receive irrigation water. The effect of this irrigation is documented in the "Infiltration and Leachability Study" [7].

(2) Page 3, Maintenance Program, bulleted list: There are two institutional control proposed for use, (1) ensure that the CC&Rs and land uses are properly implemented, and (2) restrict artificial irrigation of mixed soils. Please explain who will perform the oversight functions and under what authority. Please explain how compliance with the controls will be verified and at what frequency. Please provide the CC&Rs which will be used to bring areas in the MPC back into compliance. Please explain if the CC&Rs are to represent the control standards to be maintained. DERR suggests that if there is supporting documentation for these proposed institutional controls, KDC should attach the documents to this O&M plan as appendices.

The revised O&M plan is attached [9]. There are no institutional controls required other than ensuring that the Sunrise Project design and zoning is followed, which will be monitored and documented by South Jordan City inspectors.

Comments on the paper covering *Infiltration and Leachability of Sulfate*:

(1) Page 1, *Introduction*, 2nd paragraph, 1st sentence: Similar to comment No.1 on the O&M Plan, please explain why the mixed soils will be remaining within the MPC, while other mixed soils are being delivered to the Consolidation Area.

The mixed soils are non-hazardous. Most of the mixed soil will remain on site. The only mixed soil that will be moved to the repository is that soil which is immediately on top of the pond sediment. Logistically, the trackhoe will not be able to neat-line excavate the pond sediment and some over-excavation will occur.

(2) Page 1, *Introduction*, 2nd paragraph, 2nd sentence: It states that an impermeable liner will cover approximately half of the Consolidation Area. Please explain why a liner is needed and what the liner will be composed of. The first sentence in the paragraph infers that some portion of the mixed soils will be placed within the consolidation area. Please explain how much of the soil will be placed upon the lined area.

At this time the impermeable liner will probably be HDPE. The liner will be placed so that the pond will not lose water through its base. This consolidation area is underlain with native sandy gravel. There will be some mixed soil that may reside under the liner. Stockpiled cap soil will be used beneath the liner to decrease the chance of puncture to the liner.

(3) Page 1, *Introduction*, 2nd paragraph, 3rd sentence: The sentence states that the relocated mixed soils will be placed on 168 acres, of which 30 percent will be open space, 25 percent will be lawns and the remaining acreage will be covered by streets and houses. Please explain how much of the lawns and open space acreage will be irrigated.

At this time, all of the lawns and open space should be considered as possible irrigated land. The "Irrigation and Leachability Study" [7] indicates that even though irrigation may occur, there is a substantial reduction in sulfate load to groundwater after removal of the pond sediments.

(4) Page 3, *Sulfate Concentrations, Leachability and Mass*, 1st paragraph, 1st sentence: The sentence states that an additional 325,305 cubic yards of native soil containing elevated arsenic is planned for removal. Please explain where the arsenic material is located and what type of soil it is associated with in the consolidation area. Please provide the average, maximum and minimum concentration of the arsenic and its leachability (TCLP). Please provide the remedial standard chosen by KDC for the arsenic laden material and discuss how the removal will be verified.

The northern part of the Consolidation Area contains portions of six individual ponds. The ponds had earth levees between them. All of the northern ponds are the oldest ponds and some of these ponds received untreated waters. Four of these ponds had arsenic concentrations above 100 mg/kg in the native sandy gravel located immediately below the pond sediment. The arsenic concentrations in the native sediment for the four ponds averaged 238 mg/kg with maximum of 377 mg/kg and minimum of 7 mg/kg. All samples passed TCLP with the highest concentration at less than 0.1 ug/L [10,11]. Based upon the characterization work, the post-removal surface should be less than 100 mg/kg arsenic and probably less than 50 mg/kg.

(5) Page 3, *Sulfate Concentrations, Leachability and Mass*, 2nd paragraph, 1st sentence: It states that after the removal is complete, the total mass of sulfate remaining in the Master Planned Community (MPC) would be reduced by approximately 55 percent. Please provide an estimate on the average concentration of sulfate which will remain in the MPC. Please provide the remedial standard chosen by KDC for sulfate.

The average concentration of sulfate will be approximately 1.8 percent in the mixed soil and approximately 1.2 percent in the native soil located beneath the pond sediment. There is no relevant remedial standard for sulfate in soil. Ingestion of sulfate-bearing soil to yield concentrations of 1500 mg/l to the digestive system would require consumption of many grams of soil.

Comments on the KDC Evaporation Pond Sludge Relocation Project (drafted by Harper Contracting, Inc:

(1) Page 4, *Safety, Environment, and Traffic Control*, 2nd paragraph, bulleted list: It states that Harper anticipates the need for the drafting of a Safety, Health and Environmental Action Plan, a job specific traffic control plan, a fugitive dust control plan, a hazardous materials spill prevention and cleanup plan, a storm water pollution

prevention plan and an emergency plan. DERR advises KDC and Harper Contracting that the plans which cover various environmental controls and specify health and safety measures on-site should be provided to DERR for review.

When completed, the plans will be forwarded to DERR.

(2) Page 4, *Safety, Environment, and Traffic Control*, 2nd paragraph, bulleted list: KDC and Harper Contracting are advised that a decontamination plan should be developed for work activities associated with the removal of the arsenic contaminated material. Please provide a copy to DERR for review. DERR also advises both parties that a cross contamination prevention plan should be developed to explain how remediated areas would be protected from being impacted by nearby removal activities.

Most of the Consolidation Area has no hazardous levels of contaminates so cross contamination will not be an issue. For the four ponds containing elevated arsenic, traffic patterns and equipment crossings will be maintained to avoid crossing areas that contain potential contamination.

(3) Page 5, *Safety, Environment, and Traffic Control – Loading and Hauling*, 1st paragraph, 4th sentence: It states that decontamination sites will be equipped so that the haul truck beds can be swept off and/or blown off with compressed air. Please explain the appropriateness of using compressed air to decontaminate trucks carrying material with elevated concentrations of arsenic. Please discuss the level of exposure the workers performing decontamination activities using compressed air will confront.

Protocol will be developed to keep workers out of any artificial air generation pathways. As the pond sediment and underlying soils are damp, dust and air borne contaminants will be minimal. Personal and site air monitoring will be conducted on a regular basis. All site workers will be Hazwopper trained.

(4) Page 6, *Safety, Environment, and Traffic Control – Haul Road Maintenance*, 1st paragraph, 3rd sentence: It states that when conditions exist that are unsafe (i.e., soft spots, sharp curves, x-ings, spilled materials, ruts, etc.) maintenance equipment will be dispatched immediately to repair the area. Please explain in more detail how spilled materials will be removed and how the removal of the material will be verified.

Dependent upon the amount of spilled material, the material may be picked up with a shovel, backhoe or front-end loader. Because the pond sediment and native soils located beneath the sediment are easily identified visually by their various colors and iron staining, a visual inspection after clean up of spillage will be used to identify spillage.

(5) Page 6, *Safety, Environment, and Traffic Control – Dust Control*, 1st paragraph: Please explain the dust control requirements for the project and the air quality standards

for which the project will have to meet. Provide the air monitoring specifications for review by DERR

This will be provided to DERR at the appropriate time.

Comments on KDC's Appendix A – Post Removal Sampling and Analysis Plan:

(1) Page 1, Section 1.0 *Introduction*, 2nd paragraph, 1st sentence: It states that after sludge removal, samples will be collected to document the total lead and arsenic concentration of the post removal surface. Please explain why KDC will not be documenting the sulfate concentration in the soils of the post removal surface.

Kennecott Land will conduct a post-removal health risk assessment that will include sulfate.

(2) Page 2, Section 3.0 *Sampling Procedures*: DERR suggests that KDC discuss the frequency of sample collection and provide the acreage that each sample represents. Since this is a proposed residential development, perhaps narrowing the size of the sampling area to a traditional quarter acre lot size or smaller would be appropriate.

KDC will consider additional sampling for those areas in the northern four ponds. As the remainder of the area, based upon previous sampling, contains low levels (lead less than 400 mg/kg and arsenic less than 100 mg/kg), KDC does not believe additional sampling is necessary.

(3) Page 3, Section 3.0 *Sampling Procedures – Analyses*, 1st paragraph: Please explain why post removal samples will not be analyzed for sulfate.

Kennecott Land will conduct a post-removal health risk assessment that will include sulfate.

(4) Page 3, Section 4.0 *Quality Assurance/Quality Control Samples*: Please explain why precision has been chosen as the only measure of quality control for the project. Please explain why accuracy, representativeness, comparitability and completeness are not proposed as quality control checks.

Accuracy, representativeness and comparability will be included with the quality control and the appropriate protocol will be added to the SAP.